

# METHOD AND STRUCTURE FOR IMPROVED TRENCH PROCESSING

## Abstract

A method is provided for making a trench capacitor by forming a trench in a substrate. The trench is then widened and a sacrificial collar is formed on sidewalls of the widened trench. The trench is then vertically deepened to extend below the sidewalls of the sacrificial collar. Subsequently, a capacitor is formed in the trench below the sacrificial collar. An integrated circuit includes a deep trench structure formed in a single-crystal region of a semiconductor substrate including an upper trench portion, the upper trench portion having an opening of rectangular shape. A lower trench portion is formed below the upper trench portion. The lower portion may be widened to have a bottle shape. Alternatively, the upper trench portion may be widened relative to the lower trench portion.